

IN THE CLAIMS

Please cancel claims 2-42.

Please add and consider claims 43-52 :

43. A hemin protein having the capacity to reversibly bind oxygen, comprising at least one iron-containing porphyrin nucleus, of plant origin, and a protein component comprising at least one polypeptide chain, of animal origin.

44. The protein according to Claim 43, wherein the at least one iron-containing porphyrin nucleus is iron-containing protoporphyrin IX, or a protoporphyrin differing from protoporphyrin IX in the nature of the side chains carried by the β atoms of the pyrrole rings.

45. The protein according to claim 43, wherein the protein component comprises at least one α and/or β -globin polypeptide chain, or variants thereof comprising one or more amino acid substitution(s), deletion(s) or insertion(s), the hemin protein being capable of binding oxygen reversibly.

46. The protein according to claim 45, wherein the α or β -globin chain, or variants thereof, comprises in addition a chloroplast targeting signal, a mitochondrial targeting signal, or a N-terminal signal peptide in combination with a signal responsible for retaining a protein in the endoplasmic reticulum or a vacuolar targeting signal.

47. The protein according to claim 45, wherein each α and/or β -globin polypeptide chain lacks an NH_2 -terminal methionine.

48. The protein according to claim 43, wherein the protein component comprises at least four polypeptide chains of α and/or β -globin or variants thereof, each polypeptide chain being bound to an iron-containing protoporphyrin nucleus.

49. The protein according to claim 48, wherein the protein component comprises 2 α -globin chains and 2 β -globin chains, or variants thereof.

50. The protein according to Claim 43 wherein said protein binds oxygen with an affinity of between 7 and 40 mm Hg.

51. A pharmaceutical product comprising one or more hemin protein(s) according to Claim 43 in association with a physiologically acceptable excipient.

52. The hemin protein according to claim 51, for the treatment of conditions requiring an improvement in the transport of oxygen in the blood.